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SULFUR DIOXIDE

WHAT IS SULFUR DIOXIDE?

Sulfur dioxide, or SO_2 , belongs to the family of sulfur oxide gases (SO_x). Sulfur is prevalent in raw materials such as crude oil, coal and metal ores. SO_x gases are formed when fuels containing sulfur, such as coal and oil, are burned, when gasoline is extracted from oil or when metals are extracted from ore.

SO_2 dissolves in water vapor to form acid and interacts with other gases and particles in the air to form sulfate particles and other products that can be harmful to people and the environment. SO_2 and the pollutants formed from SO_2 , such as sulfate particles, can be transported over long distances and deposited far from the point of origin. Air quality problems with SO_2 are not confined to areas where it is emitted.

WHERE DOES SULFUR DIOXIDE COME FROM?

Emission Sources	
<ul style="list-style-type: none">• Petroleum refineries• Oil fired boilers• Coal and oil fired electric utilities• Nonroad diesel equipment	<ul style="list-style-type: none">• Home heating oil• Locomotives• Large ships• Chemical manufacturing

WHAT ARE THE HUMAN HEALTH AND ENVIRONMENTAL EFFECTS?

Health Effects	Environmental Effects
<ul style="list-style-type: none">• Associated with increased respiratory disease• Can aggravate existing heart disease• Can cause temporary breathing difficulty, particularly for people with asthma• The elderly and children are at highest risk of health effects from exposure to SO_2.	<ul style="list-style-type: none">• Harms vegetation and ecosystems (e.g. sedimentation)• Contributes to the formation of acid rain (e.g. making soils, lakes and streams more acidic)• Damages trees and crops• Damages buildings and monuments

SO_2 also contributes to the formation of fine particulates (i.e. fine-particle pollution), which can cause breathing difficulties, premature death, and impair visibility.

WHAT ARE THE MONITORING TRENDS IN NEW JERSEY?

Over the years, air quality in New Jersey has been improving. While SO₂ regularly reached unhealthy levels 15 to 20 years ago, this pollutant now meets the national health standards throughout the state and is considered to be well under control. However, SO₂ is a precursor to fine-particle pollution, which must be reduced to comply with the new federal health-based standards. New, more stringent federal health-based standards for fine particulates, which were promulgated in 1997, require states to do more to protect human health. New Jersey's air monitoring program evaluates hourly air quality readings using the national methodology called the Air Quality Index (AQI). The AQI uses five of the six pollutants for which there are national health-based standards (ground-level ozone, particulates, carbon monoxide, nitrogen dioxide and sulfur dioxide) and compares the composite pollutant levels to the federal standards in order to assign an air quality rating such as "good" or "unhealthy."

Based on the AQI scale, New Jersey had 28 days of unhealthy levels of ozone and fine-particle pollution in 2003 with 8 days only attributable to unhealthy levels of fine-particle pollution. Even with wet, cool summer conditions favorable to healthy air, New Jersey still experienced 19 days of unhealthy ozone and fine-particle pollution in 2004 with 5 days only attributable to unhealthy levels of fine-particle pollution. New Jersey experienced 29 days of unhealthy ozone and fine-particle pollution in 2005 with 7 days only attributable to unhealthy levels of fine-particle pollution.

WHAT IS BEING DONE ABOUT SULFUR DIOXIDE?

- ❖ Under the federal Clean Air Act, the U.S. Environmental Protection Agency (USEPA) has set protective health-based standards for SO₂ in the air we breathe. The USEPA and state and local governments have instituted a variety of multi-faceted programs to meet these health-based standards.
- ❖ Throughout the country, additional programs are being put into place to cut SO₂ emissions from nonroad diesel equipment, industrial facilities, and electric utilities, such as decreasing the sulfur content in onroad and nonroad fuels, as well as in heating oil.
- ❖ In May 2003, New Jersey announced a landmark agreement with PPL Generation, negotiating the shutdown of two of its coal-fired units at its Martins Creek power plant in Pennsylvania. This agreement marked the first time that a state was able to negotiate the shutdown of a coal-fired power plant outside its borders. This agreement with PPL Generation will lead to an 80-percent reduction, more than 20,000 tons per year, of the plant's sulfur dioxide emissions by 2007 and will improve air quality in Warren County. Portions of Warren County had been designated a nonattainment area for SO₂ because of emissions from this plant.
- ❖ Even though there are multiple initiatives in place to reduce SO₂, we need to do more to reduce SO₂ emissions and fine-particle pollution in order to improve air quality in New Jersey.